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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/986,136	11/07/2001	Byung Hee Sohn	263/009	4660

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EXAMINER

GARRETT, DAWN L

ART UNIT

PAPER NUMBER

1774

DATE MAILED: 03/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/986,136

Applicant(s)

SOHN ET AL.

Examiner

Dawn Garrett

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 05 March 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) 17 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3-5, 11-13 and 18 is/are allowed.
- 6) ☒ Claim(s) 1, 2, 6-10 and 14-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☒ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Election/Restrictions***

1. Applicant's election without traverse of Group I (claims 1-16) in Paper No. 7 is acknowledged. Claims 17 and 18 were withdrawn as non-elected claims.

***Priority***

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

***Oath/Declaration***

3. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02. The oath or declaration is defective because:

The signature of Kyung Kon Kim is not dated.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1, 2, 6-10, and 14-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
6. The variable "n" in the formulas of claims 1 and 6 has not been defined and accordingly, it is unclear how many repeating units in parenthesis may be present in the

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polymer. For the purpose of examination, "n" has been interpreted as an integer of one or greater. Clarification and correction are required.

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claim 1 is rejected under 35 U.S.C. 102(a) as being anticipated by Journal of the Korean Physical Society, 37(1), 59-63, 2000. The journal article discloses a compound, PCzPV, which is the same as instant formula 1 wherein  $X_1-X_5$  = hydrogen (see top of first column, page 60). Accordingly, the Journal of the Korean Physical Society is deemed to anticipate claim 1.

9. Claim 1 is rejected under 35 U.S.C. 102(a) as being anticipated by Chemical Materials, 2000, 12, pages 1067-1070. The journal article discloses a compound, PCzPV, which is the same as instant formula 1 wherein  $X_1-X_5$  = hydrogen (see middle of first column, page 1068). Accordingly, the Chemical Materials article is deemed to anticipate claim 1.

10. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Synthetic Metals, 102 (1999), pages 961-962. The journal article discloses a compound, PCzPV, which is the same as instant formula 1 wherein  $X_1-X_5$  = hydrogen (see page 961, section "2"). Accordingly, the Synthetic Metals article is deemed to anticipate claim 1.

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11. Claims 1, 2, and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Advanced Materials (Weinheim, Germany), 10(14), 1112-1116, 1998. The journal article discloses a compound, PCzPV, which is the same as instant formula 1 wherein  $X_1-X_5$  = hydrogen (see page 1113, first column, compound number 2) per instant claim 1. The average molar mass of the PCzPV compound is 16,000 and the poly-dispersity index is 1.87 (see page 1113, second column, first full paragraph) per instant claim 2. The PCzPV compound is taught as a light emitting layer between an ITO anode and an aluminum cathode per instant claim 8 (see page 1114, second column, second full paragraph). Accordingly, the Advanced Material article is deemed to anticipate claims 1, 2, and 8 as it discloses the same polymer and structure of an EL device.

***Claim Rejections - 35 USC § 103***

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 6, 9, 10, 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Advanced Materials (Weinheim, Germany), 10(14), pages 1112-1116, in view of Jin et al. (US 6,368,732). With regard to claims 9 and 10, the rejection of claims 1 and 8 are relied upon as set forth above. Advanced Materials teaches the electroluminescent polymer, PCzPV, which reads upon instant formula (1), is disposed between an anode or a cathode, but fails to teach a device that is multi-layered comprising also a buffer layer adjacent the anode and a hole-blocking layer adjacent the

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cathode. Jin et al. teaches in analogous art, a conventional embodiment of an electroluminescent device comprising the structure anode/buffer layer/hole transporting layer/light emitting layer/hole blocking layer/cathode (see col. 8, lines 12-14). The light emitting layer of Jin et al. also comprises a PPV derivative. The Jin buffer layer is comprised of polythiophene, polyaniline, polyacetylene, polypyrrole, or poly(p-phenylenevinylene) derivatives. The hole blocking layers are preferably made of LiF or  $\text{MgF}_2$  (see col. 8, lines 14-17). Jin et al. also teaches an EL device may have a structure of an anode/light emitting layer/cathode (see col. 8, line 8) just as the Advanced Materials article discloses as the device structure using the PPV derivative, PCzPV. It would have been obvious to one of ordinary skill in the art to have used the PCzPV electroluminescent polymer taught by Advanced Materials in a multi-layered device comprising both a buffer layer and hole blocking layer as required by instant claims 9 and 10, because Jin et al. teaches these layers are common to EL device structures and these layers in combination with a PPV derivative light emitting layer help to create an improved and efficient light emitting device.

With regard to claims 6 and 14-16, Jin et al. teaches an electroluminescent device comprising a anode/buffer layer/hole transporting layer/light emitting layer/hole blocking layer/cathode structure per instant claim 14 (see col. 8, lines 12-14). The Jin buffer layer is polythiophene, polyaniline, polyacetylene, polypyrrole, or poly(p-phenylenevinylene) derivatives per instant claim 15 and the hole blocking layers are preferably made of LiF or  $\text{MgF}_2$  per instant claim 16 (see col. 8, lines 14-17). The light emitting layer is comprised of a PPV-based polymer (see abstract). It would have been

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obvious to one of ordinary skill in the art at the time of the invention to have used the PPV-based PCzPV light-emitting polymer taught by Advanced Materials in the light emitting layer of Jin et al. comprising a PPV-derivative polymer, because, absent evidence otherwise, "it is *prima facie* obvious to combine two compositions taught by the prior art as useful for the same purpose, in order to form a third composition which is to be used for the very same purpose" (see *In re Kerkhoven*, 205 USPQ 1069, 1072 (CCPA 1980); *In re Susi*, 169 USPQ 423, 426 (CCPA 1971); *In re Crockett*, 126 USPQ 186, 188 (CCPA 1960)).

***Allowable Subject Matter***

14. Claims 3-5 and 11-13 are allowed. Also, claim 18 is rejoined as a method of making the allowable polymer of instant claim 3 and is allowed. Claim 7 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim (with correction and clarification of the base claim that is currently rejected under 35 USC 112, second paragraph) and any intervening claims. The closest prior art is considered to be Advanced Materials (Weinheim, Germany), 10(14), pages 1112-1116, 1998. The reference fails to teach a PCzPV skeleton-containing compound comprising X substituents as claimed wherein at least one of the X substituents is not a hydrogen as set forth in claim 3. With regard to claim 7, the prior art fails to teach a composition comprising a PCzPV polymer and the specific PPV-based compounds set forth in claim 7 in an EL device.

***Conclusion***

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure or cumulative to the prior art discussed herein.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dawn Garrett whose telephone number is (703) 305-0788. The examiner can normally be reached Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly can be reached at (703) 308-0449. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-2351.

*Dawn L Garrett*  
DAWN GARRETT  
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D.G.  
March 21, 2003